Accretion of the Moon in an Impact-Generated Disk

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In a recent work (Canup and Esposito 1996, Icarus 119), we presented the first numerical calculations of accretion in an impact-generated protolunar disk. That analysis, which included both moonlet accretion and orbital evolution, demonstrated that multiple small moons are the final result unless some particularly severe constraints on initial disk conditions are met. Our current work investigates whether mutual perturbations between moonlets as they tidally evolve through mean motion resonances could make it more probable for multiple small moonlets to collide and form a single massive Moon. To this end, we have added perturbations due to the potential of a tidal bulge raised on the Earth by an orbiting body to the Levison and Duncan (1994, Icarus 108) mixed-variable integrator, SWIFT. Preliminary results show that the 2:1 resonance is effective at perturbing a smaller inner moonlet into a crossing orbit with a more massive outer body for some cases where such a collision is precluded by previous analytic approaches.

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